

REMARKS/ARGUMENTS

With respect to applicant's claim for priority noted in paragraph 3 of the Office Action, a certified copy of European Patent Application 03396003.0 was forwarded to the USPTO in conjunction with the response made to the Notice of Missing Parts. This response was submitted under a Certificate of Mailing dated June 10, 2004. Inasmuch as the other portions of this response were received, it is requested that the USPTO file of this application again be reviewed to ascertain the presence or absence of the certified copy of the European priority application. Further, the Image File Wrapper of this application maintained by the USPTO and available on the PAIR data base indicates the certified copy is in the file wrapper.

The Abstract has been amended along the lines noted by the Examiner to place same in the proper language and format. The Abstract has been further amended to render same more concise and to specifically describe the subject matter of the application disclosure.

Claims 5 and 11 have been amended to correct the minor grammatical errors also noted by the Examiner and to remove the objections made to the claims.

With respect to the rejection of the claims under 35 U.S.C. §112, claim 1 has been amended to make it clear that the subject matter of the claim is the electrode switching and grounding arrangement shown in Fig. 4 of the drawing. Thus, the Examiner's interpretation made in paragraph 9 of the Office Action is correct and is now incorporated in the claim language.

Claim 5 has been amended to remove any indefiniteness by making it clear which elements are being claimed. The Examiner's interpretation noted in connection with this claim is similarly correct.

Claims 7, 8, 17 and 18 have also been amended to place them in a more appropriate, structural format. Claim 9 has been amended to provide a structural relationship for the detecting circuit.

Withdrawal of the rejection of the claims under 35 U.S.C. §112 is respectfully requested.

Substantively, independent claim 1 and independent claim 5 were rejected as anticipated by the disclosure of U.S. Patent 2,976,462 to Miller. Claim 1 was additionally rejected as anticipated by the disclosure of U.S. Patent 4,890,630 to Kroll et al. Certain claims dependent on independent claims 1 and 5 were similarly rejected on one or both of the Miller and Kroll et al. references.

Claims 3, 4, and 9, dependent on claim 1 were rejected under 35 U.S. C. §103 on the Kroll et al. reference in view of U.S. Patent 5,042,498 to Dukes or U.S. Patent 4,848,355 to Manes. Claim 10 was also rejected on the Kroll et al. and Dukes references. Claim 11 was also rejected on the combination of the Kroll et al. and Manes references.

The present invention relates to a grounding arrangement for use with an ECG monitoring system. In addition to a selective grounding function, the grounding arrangement of the present invention is used for detecting whether some connector elements of a lead set connector are in use for recording ECG signals or whether they are in use for the grounding of the lead wires. When the connector elements are connected for recording ECG signals from measuring electrodes, a 12-lead ECG signal is acquired. On the other hand, when the connector elements are connected for grounding purposes, a 5-lead ECG signal is acquired and the measuring electrodes are grounded by a current limiting circuit of the grounding arrangement. See also the succinct summary of the invention on page 7, lines 16-23 of the substitute specification.

U.S. Patent 4,890,630 to Kroll et al. discloses a device and method for the cancellation of bio-electric noise from bio-electric signals measured on the body of a patient. The device comprises electrodes, each having a conductive lead and a surrounding shield. Current limiters are connected in-line with the conductive leads, the current limiters comprising, for example, transistors, resistors, and diodes. The device and method shown in the Kroll et al. reference does not include a means for selectively grounding lead wire

shields and for detecting whether the connector elements are used for ECG recording or grounding purposes as now recited in amended claim 1.

U.S. Patent 2,976,462 to Miller discloses a protective system for a signal-carrying conductor. The conductor is connected via a threshold-voltage-operated switching device (e.g. a resistor and a diode) to a reference terminal, such as ground. The disclosure of this reference similarly does not anticipate the grounding arrangement capable of detecting the use to which the connector elements are put as now recited in detail in independent claims 1 and 5.

The anticipation of dependent claims 6, 7, 8, 16, 17, and 18 is avoided for the same reasons as independent claims 1 and 5.

With respect to the rejections under 35 U.S.C. §103, the secondary Dukes and Manes references do not overcome the shortcomings of the main Kroll et al. and Miller references with respect to the amended claims. Specifically, U.S. Patent 5,042,498 to Dukes discloses circuitry that determines the quality of an ECG electrode - patient skin interface and provides a warning at the patient end of an electrode assembly if the electrical properties are faulty or inadequate. The reference does not disclose circuitry for determining the use - signal collection or shielding - to which certain connector elements are put.

U.S. Patent 4,848,335 to Manes discloses a monitor for measuring the quality of a patient - electrode interface. The '335 patent does not deal with collecting ECG signal from a patient but rather with apparatus for applying high frequency electricity to a patient for electro-cauterization or electro-surgery. A current to be fed to the patient is acquired from a conventional RF power source, shown as element 11 in Fig. 1B, and is fed to the patient (P) through an active electrode 13. The resistance of the return electrode 14, 24 affects potential VS shown in Fig. 1A. If the contact between the patient and the return electrode is poor, i.e. if a high patient interface resistance is present, a microprocessor 23 produces an alarm output and operation of the electro-surgical apparatus is prevented.

In sum, none of the references teach or suggest a grounding arrangement suitable for use in an ECG measurement system in which some of the connector elements of

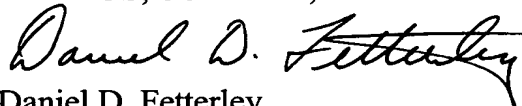
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Reply to Office Action of September 14, 2005

an ECG lead set connector are used either for recording ECG signals from measuring electrodes, as in 12-lead electrocardiography, or for grounding lead wire shields when a smaller number of electrodes are used, as in 5-lead electrocardiography. The current-limiting circuit recited in the grounding arrangement of the claims of the present application comprises a means for both detecting whether the connector elements are in use for recording or in use for grounding and for providing a means for effectuating the grounding.

Claims 1, 3-11, and 16-18 are thus deemed to define subject matter patentable over the references and to be allowable. Withdrawal of the objections/rejections made in the Office Action of September 14, 2005 is respectfully requested. Passage of this application to allowance is similarly requested.

Respectfully submitted,

ANDRUS, SCEALES, STARKE & SAWALL, LLP

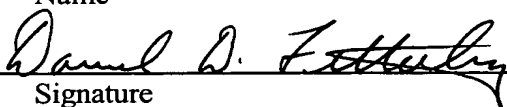


Daniel D. Fetterley
(Reg. No. 20,323)

100 East Wisconsin Avenue, Suite 1100
Milwaukee, Wisconsin 53202
(414) 271-7590

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I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, Mail Stop - Fee, P.O. Box 1450, Alexandria, VA 22313-1450 on the 17th day of January, 2006.

Daniel D. Fetterley	20,323
Name	Reg. No.
	1/17/06
Signature	Date